

REMARKS**I. REJECTION UNDER 35 U.S.C. 112, SECOND PARAGRAPH**

Claims 1 to 18 were rejected under 35 U.S.C. 112, second paragraph, for indefiniteness.

Claims 1 to 18 were English translations of claims of a foreign patent document and indeed included numerous grammatical and idiomatic errors.

Claims 1 to 18 were canceled, obviating this rejection.

New claims 19 to 36 filed above contain the subject matter of canceled claims 1 to 18, but have been drafted considering U.S. Patent Office Rules. New independent claim 19 includes the same features and limitations as canceled claim 1. New claim 36 has been drafted as a statutory method claim, instead of a "use" claim.

Antecedent basis for claim terms has been checked and is believed to be maintained. Markush wording is used where it appeared to be appropriate. Parenthetical expressions are not used, except for drawing reference numbers, which is generally acceptable according to U.S. Patent Office Rules.

Claim 21 corresponds to canceled claim 3. Basis for the change in wording of this claim is found on page 14, line 18, of the originally filed specification.

Claim 24 corresponds to canceled claim 6. The basis for the changes in

the wording of this claim is found on page 16, lines 10 to 15, of the originally filed specification.

For the foregoing reasons and because of the changes in the wording of the new claims 19 to 36, it is respectfully submitted that none of the new claims 19 to 36 should be rejected under 35 U.S.C. 112, second paragraph.

II. REJECTION UNDER 35 U.S.C. 103 (a)

Claims 1, 3 to 5, 7, 15 and 18 were rejected under 35 U.S.C. 103 (a) as obvious over Ostendarp, et al, in view of Kamii, et al.

Claims 1 to 18 have been canceled, at least partially obviating this rejection. However new claim 19 includes the subject matter of canceled claim 1.

It is respectfully submitted that the subject matter of new claim 19 is not obvious from Ostendarp, et al, in view of Kamii, et al.

The shaping tool, disclosed by German Patent DE 197 13 309 C1 and German Patent Application DE 197 13 312 A1, does not provide the benefits of the shaping tool according to new claim 19. It has a structured surface for creating structures on glass using the principle of reshaping warm-shaping. This shaping tool, in the exemplary embodiment, has a rolling cylinder, comprising a solid cylinder of preferably nonmetal material, to which a molding tool with the structure-imparting surface is clamped, resting relatively loosely. On each of the two end faces of the solid cylinder, a respective bearing journal for the rotational

mounting of the rolling cylinder is provided. An external heating source is provided for the requisite local heating of the shaping tool.

This embodiment of the shaping tool does not make it possible in practice to create precision structures with the desired replicable precision, since the necessary thermal dimensional stability has not been adequately taken into account in the design of the individual components and in the bearing of the rolling cylinder. The enormously stringent specifications for making precision structures in glass cannot be met.

Ostendarp, et al, does **not** disclose a rolling cylinder 3 comprising metallic hollow cylinder 7, as claimed in claim 19 above. This reference does **not** disclose a metal shaping sheet 8 "in intimate surface-to-surface or large area contact" with the metallic hollow cylinder 7, as claimed in claim 19 above. Ostendarp, et al, does not disclose a shaft extending through the hollow cylinder with the two drivers attached thereto at opposite ends of the shaft, which are in operative positively-locking engagement with the hollow cylinder, as claimed in the main independent claim 19. Last but not least, Ostendarp, et al, does **not** disclose an electric heater arranged electrically insulated between the shaft and thermally insulated with respect to the shaft, as claimed in independent claim 19.

The known shaping tool of Ostendarp, et al, does not make it possible in practice to create precision structures in glass with the desired repeatable precision. On the other hand, the above-mentioned stringent specifications for making the precision structures can be met with the shaping tool of the invention, as claimed in claim 19.

In addition, Ostendarp, et al, clearly teach the opposite from the claimed invention. The shaping tool claimed in claim 19 has an electrical heater for internal heating, instead of external heating. The shaping tool claimed and described in Ostendarp, et al, clearly has no means for internal heating and requires external heating (see claim 13, lines 6 to 8, i.e. column 10, line 67; column 4, lines 61 to 63; column 2, line 53 to 61) to locally heat only the structuring surface. This is teaching away from using an internal heat source that would locally heat the structuring surface from the inside of the forming tool.

It is well established that a reference or references that teach the opposite from a claimed invention cannot be combined with other references to reject the claimed invention under 35 U.S.C. 103 (a). See for example M.P.E.P. 2145. X. Also U.S. judicial decisions have stated this principle, for example:

"That the inventor achieved the claimed invention by doing what those skilled in the art suggested should not be done is a fact strongly probative of nonobviousness." in Kloster Speedsteel AB v. Crucible Inc., 230 U.S.P.Q. 81 (Fed. Cir. 1986), on rehearing, 231 U.S.P.Q. 160 (Fed. Cir. 1986).

Kamii, et al, (US 4,023,391) is clearly from a different field of art, namely the rolling mill arts. Rolling mills are used to shape metal plates, sheets or strips, not glass articles (claim 1, column 13, lines 20 to 25). The reference is owned by Nippon Steel and it is so well known that rolling mills are used only for rolling metal, particularly steel articles, that the reference, like many others in the field scarcely mentions that the material of the plates is steel or some other metal in the specification. However the U.S. classification numbers of Ostendarp, et al,

and Kamil, et al and the Fields of Search clearly show there is no relation between the fields of these two references. The reason is simply that glass cannot take the stresses and forces that rolling mills produce to shape metal, especially steel, plate. Thus features of apparatus to shape metal parts, especially steel, are of no interest to those interested in shaping glass or especially in providing precisely formed structures in glass surfaces.

Kamil, et al, discloses a method and an apparatus of controlling the shape of rolled objects, such as metal plate, sheet, strip and the like, by adjusting the size of a crown of a roll in a rolling mill by heating the inside of the center hole made along the center axis of the roll and thus causing a change in the diameter of the roll (see claim 1, lines 30 to 40). However the heating of Kamii, et al, only causes an insignificant heating of the surface of the roll (equivalent to applicants' structuring surface, as claimed in column 13, lines 38 to 40).

The purpose of the heating in Kamil, et al, is clearly to change the diameter or size of the roll in different regions along the axis of the roll in order to provide a rolled metal plate that has a uniform thickness across its width. Often in the prior art the rolled plates leaving the rolling mill were concave in their center (column 2, line 24 to 28; column 5, line 63 to column 6, line 5). By causing the crown of the roll or a center portion of the roll to expand by heating the apparatus of Kamii, et al, corrects this deficiency. However the apparatus of Kamii, et al, or the heated roll of Kamil, et al, is designed *so that it does not heat the surface of the roll or change the temperature distribution at the surface to any significant*

degree. See column 5, line 50 to column 6, line 19 and compare Figs 9 and 10 of Kamii, et al.

Thus Kamii, et al, is not reasonably related to the problem that the claimed invention is designed to solve, namely to provide precisely formed structures in glass, particularly in a channel plate for a flat screen display, by local heating of the glass to be structured (page 6, line 20 to 25, of the applicants' specification). Also note the manner in which the heater is claimed in claim 19, i.e. as a heater for local heating of the glass. Kamii, et al, in contrast, teaches against such local heating of the metal plate using the internal heater of his rolls (see Figs. 9 and 10 of Kamii, et al, and the discussion in Figs. 9 and 10). The internal heater of Kamii, et al, is designed to act on the roll to change its diameter in local regions of the roll, such as the center of the roll, but not to heat the surface of the roll to any significant extent (column 13, line 38 to 40). According to applicants' specification on page 7, lines 18 to 20, the heating of the heater causes "targeted local heating" of the glass, which requires of course that the outer portions of the rolling cylinder are heated. This feature is now included in the independent apparatus claim, claim 19.

Thus, Kamii, et al, is clearly non-analogous art, which cannot be combined with Ostendarp, et al, under 35 U.S.C. 103 (a). Kamii, et al, fails the basic test of a prior art reference from a different field of art, which establishes whether or not the reference is analogous or non-analogous art. This test is whether or not the reference from the different field of art is reasonably pertinent

to the problem that the claimed invention is designed to solve. For example, the Federal Circuit Court of Appeals has stated this basic test:

"whether the reference is still reasonably pertinent to the particular problem with which the inventor is involved." *In re Clay*, 23 U.S.P.Q. 2d 1058 (Fed. Cir. 1992) (underlining for emphasis is ours).

But Kamii, et al, is clearly non-analogous art because it teaches that the purpose of the heating of the central portion of the roll is to change parts of the diameter of the roll without changing the temperature distribution or heating the surface differently. This is a different purpose than targeted local heating of the glass during structuring a surface of the workpiece.

In fact, Kamii, et al, then teaches the opposite from the claimed invention in any case.

In addition, all features of claim 19 of the invention that are not disclosed in Ostendarp, et al, are clearly not disclosed in Kamii, et al. For example, the electrical heater 6 of claim 19 is not inserted in a solid rolling roll as in Ostendarp, et al or Kamii, et al, but is arranged between the cylinder wall and the drive shaft in the hollow cylinder so that it is thermally insulated from the shaft. There is no drive shaft in the case of the roll of Kamii, et al. Also Ostendarp, et al, does not disclose a drive shaft that passes through the roll. A roll axis is not an axle or a shaft; it is the axis around which the roll rotates.

Also the ceramic cylinder of the dependent claims is neither disclosed nor suggested in either reference. Thus the shaft is not heated by the heater but the structuring surface is. This saves energy.

Neither Ostendarp, et al, nor Kamii, et al, teach or suggest the particularly advantageous structure for driving the rolling cylinder 3 including the drivers 4 coupled with the rolling cylinder 3 that are attached to the shaft 5 in positive operative engagement, as claimed in claim 19.

Therefore, Kamii, et al, provides no suggestion of many of the modifications of the disclosures in Ostendarp, et al, which are necessary to arrive at the invention as claimed in new claim 19.

It is well established by many U. S. Court decisions and also by the Manual for Patent Examining Procedure that to reject a claimed invention under 35 U.S.C. 103 (a) there must be some hint or suggestion in the prior art of the modifications of the disclosure in a prior art reference or references used to reject the claimed invention, which are necessary to arrive at the claimed invention. For example, the C.C.P.A. said:

"In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the references before him to make the proposed substitution, combination or other modification." *In re Lintner*, 173 U.S.P.Q. 560, 562(C.C.P.A. 1972)

Kamii, et al, do not suggest the changes or modifications in the disclosure in Ostendarp, et al, that are necessary to arrive at the invention as claimed in claim 19. Furthermore Kamii, et al, do not disclose or suggest some of the features that are missing from the disclosures in Ostendarp, et al.

For the foregoing reasons and because of the new wording in new claims

19 to 36, it is respectfully submitted that none of the new claims 19 to 36 should be rejected under 35 U.S.C. 103 (a) over Ostendarp, et al, in view of Kamii, et al.

III. Foreign Patents Granted for the Same Invention

A European Patent EP 1 133 452 B1 including forming or shaping tool claims of substantially the same scope as claim 19 has been granted. Also a similar German Patent DE 198 47 549 C1 has been granted. Copies of these two granted foreign patents have been filed together with an Information Disclosure Statement.

APPENDIX SHOWING THE CHANGES IN THE SPECIFICATION AND ABSTRACT

Underlining shows additions, brackets show deletions:

In the Specification:

Page 7, lines 15 to 20, the following changes are made in the paragraph between these lines:

Because of the [how] manner in which the hot-shaping tool of the invention is constructed, it is economically possible, by simply rolling along the glass substrate, to form high-precision microstructures on the glass upon contact with the glass, by means of targeted local heating of the glass to be structured.

Page 12, lines 6 to 10, the following changes are made in the paragraph between these lines:

These conditions are met by the shaping roller 1 shown in the drawing, which is constructed of four central components. These four central components are: a rolling cylinder [2] 3, two drivers 4, a shaft 5, and a heater 6, which for the sake of clarity is shown separately in Fig. 3.

In the Abstract:

Page 28, the following changes were made:

[Abstract] ABSTRACT OF THE DISCLOSURE

[SHAPING TOOL WITH STRUCTURED SURFACE FOR CREATING STRUCTURES
ON GLASS, AND ITS USE IN STRUCTURING CHANNEL PLATES]

[In the field of glasses with optical functions, glasses with a specific precise surface structuring are required, for instance in display screens of the new flat screen generation, or so-called channel plates.]

While avoiding the disadvantages of the screen printing technique employed until now, the invention provides a shaping tool (1) with a structured surface for creating structures on glass (2) which, in an economical way, makes it possible to form high-precision microstructures by local heating of the region of glass to be structured. The [fact that the invention] shaping tool (1) has a rolling cylinder (3) [with] including a metal hollow cylinder (7) and a shaping sheet (8) secured in a surface contact to it, as well as a continuous shaft (5) for

continuously driving the rolling cylinder (3) via drivers (4) coupled to the hollow cylinder (7). Between the shaft (5) and the hollow cylinder (7), an electric heater (6) for targeted local heating of the glass during structuring is disposed in an electrically insulated fashion. The electric heater (6) is advantageously thermally insulated from the shaft (5) with a ceramic cylinder (14).

[(Fig. 1)]

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,



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